



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,227	09/24/2003	Stefan Bader	5367-44	2158
27799 7590 11/16/2007 COHEN, PONTANI, LIEBERMAN & PAVANE 551 FIFTH AVENUE SUITE 1210 NEW YORK, NY 10176				
			EXAMINER ROSE, KIESHA L	
			ART UNIT 2822	PAPER NUMBER
			MAIL DATE 11/16/2007	DELIVERY MODE. PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/669,227

Applicant(s)

BADER ET AL.

Examiner

Kiesha L. Rose

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-13 and 15-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-13 and 15-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the amendment filed 24 August 2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7,9,11-13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. Patent 6,465,808) and further in view of Sugiyama et al. (U.S. Patent 6,573,527).

In re claim 1, Lin discloses a light emitting device (Fig. 5) that contains a semiconductor body (120-160) comprising an active zone (140), a patterned contact layer (182) applied on a surface of the semiconductor body for electrical contact connection, interspaces distributed over the contact layer for the purpose of forming free areas on the surface which are not covered by the contact layer and a mirror (184) for covering the free areas. Lin discloses all the limitations except for the contact layer to have a thickness of 100nm or less. Whereas Sugiyama discloses a LED (Fig. 1) that contain a patterned contact layer (3b) that has a thickness of 5nm. The contact layer has a thickness of 5nm in order control the density of the quantum structure. (Col. 8,

Art Unit: 2822

lines 12-15) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Lin by incorporating the contact layer to have a thickness of 5nm to control the density of the quantum structure as taught by Sugiyama.

In re claim 2, Lin discloses the mirror is embodied as a closed mirror layer covering the free areas and the contact layer. (Fig. 5)

In re claim 3, Lin discloses the material of the contact layer links electrically better to the semiconductor body than the material of the mirror. (Column 4, lines 7-11 and 45-49)

In re claim 4, Lin discloses the material of the mirror layer reflects the radiation generated in the active zone better than the material of the contact layer. (Column 4, lines 42-52)

In re claim 5, Lin discloses the surface of the semiconductor body is formed by a p-doped layer (160) made of a nitride compound semiconductor, and in which the material of the contact layer forms an ohmic contact with respect to the surface. (Column 4, lines 13-16)

In re claim 6, Lin discloses the contact layer contains nickel. (Column 4, lines 7-11)

In re claim 7, Lin discloses the mirror layer contains aluminum. (Column 4, lines 45-49)

In re claim 9, Lin discloses the contact layer comprises contact elements (182) that are separated from one another and in which a connecting layer (184) for making contact among the contact elements is provided on the contact layer.

In re claim 11, Lin discloses the contact elements are arranged at the nodes of a regular grid. (Fig. 4)

In re claim 12, Lin discloses the regular grid is a square grid. (Fig. 4)

In re claim 13, Lin discloses the surface of the semiconductor body is formed by a p-doped layer (160) made of a nitride compound semiconductor, the p-doped layer having a surface which faces the active zone and constitutes an interface, wherein there are distances between the contact elements is related to the transverse conductivity of the p-doped layer such that the entire interface can be energized.

In re claim 16, the interspaces are filled with a filler in order to partially planarize the surface of the patterned contact layer. (The filler is layer 184 since it fills the interspaces)

Claims 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin and Sugiyama as applied to claims 1,9,11 above, and further in view of Marshall et al. (U.S. Patent 6,673,254).

In re claims 10 and 15, Lin and Sugiyama disclose all the limitations except for the contact elements to have a form a cylinder and have a hexagonal grid. Whereas Marshall discloses contact elements (14) (Fig. 1) that have a form of cylinders and the grid is hexagonal. The contact elements are cylinders and the grid is hexagonal to minimize the total number of contact elements per unit area of the reflective layer.

Art Unit: 2822

(Column 4, lines 65-67, Column 5, lines 1-11) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the devices of Lin and Sugiyama by incorporating the contact elements to have a form of a cylinder and to have a hexagonal grid to minimize the total number of contact elements per unit area of the reflective layer as taught by Marshall.

Claims 17, 18 and 20-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Lin and Sugiyama as applied to claims 1 and 16 above, and further in view of Coman et al. (U.S. Publication 2001/0042866).

In re claim 17, Lin and Sugiyama disclose all the limitations except for the filler material to be an electrically conductive material. Whereas Coman discloses a light emitting device (Fig. 3) that contains a filler (26a), which contains an electrically conductive material. The filler is an electrically conductive material to produce a highly reflective mirror. (Page 1, Paragraph 0006) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Lin and Sugiyama by incorporating an electrically conductive material to produce a highly reflective mirror as taught by Coman.

In re claims 18 and 20, Coman discloses the filler contains a transparent and electrically insulating material, SiO₂. (Page 3, Paragraph 0023)

In re claims 21, 22 and 24, Coman discloses a light-emitting device (Fig. 3) that contains a filler that forms a Bragg reflector (26a) that is produced from dielectrics and is arranged in the interspaces of the contact layer. (Page 3, Paragraph 0023)

In re claim 23, Coman discloses the Bragg reflector is produced by epitaxy.

(Page 1, Paragraph 0006)

In re claim 25, Coman discloses the Bragg reflector contain layer pairs lying one on top of the other, of which respectively one has a high refractive index and one has a low refractive index and in which the number greater than 5 of layer-pairs are provided in each Bragg reflector. (Page 1, Paragraphs 6 and 9, Page 3, Paragraph 0023)

Claim 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin, Sugiyama and Coman as applied to claims 1 and 16-17 above, and further in view of Huang et al. (U.S. Patent 6,693,352).

In re claim 19, Lin, Sugiyama and Coman disclose all the limitations except for the filler to contain zinc oxide or indium tin oxide. Whereas Huang discloses a light-emitting device (Fig. 7) that contain contact layers (36a) with interspaces where the interspaces is filled with a filler that is zinc oxide or indium tin oxide. The filler is zinc oxide or indium tin oxide to function as a transparent conducting oxide. (Column 5, lines 23-33) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the devices of Lin, Sugiyama and Coman by incorporating the filler to be zinc oxide or indium tin oxide to function as a transparent conducting oxide as taught by Huang.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin and further in view of Marshall.

In re claim 26, Lin discloses a light emitting device (Fig. 5) that contains a semiconductor body (120-160) comprising an active zone (140), a patterned contact

Art Unit: 2822

layer (182) applied on a surface of the semiconductor body for electrical contact connection, wherein the contact layer comprises contact elements (182) that are separated from one another, interspaces distributed over the contact layer for the purpose of forming free areas on the surface which are not covered by the contact layer and a mirror (184) for covering the free areas. Lin discloses all the limitations except for the contact elements to have a form a cylinder. Whereas Marshall discloses contact elements (14) (Fig. 1) that have a form of cylinders. The contact elements are cylinders to minimize the total number of contact elements per unit area of the reflective layer. (Column 4, lines 65-67, Column 5, lines 1-11) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Lin by incorporating the contact elements to have a form of a cylinder to minimize the total number of contact elements per unit area of the reflective layer as taught by Marshall.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin and further in view of Coman.

In re claim 27, Lin discloses a light emitting device (Fig. 5) that contains a semiconductor body (120-160) comprising an active zone (140), a patterned contact layer (182) applied on a surface of the semiconductor body for electrical contact connection, interspaces distributed over the contact layer for the purpose of forming free areas on the surface which are not covered by the contact layer and a mirror (184) for covering the free areas. Lin discloses all the limitations except for the interspaces are filled with a filler in order to at least partially planarize the surface of the patterned

Art Unit: 2822

contact layer and the filler contains a transparent and electrically insulating material.

Whereas Coman discloses a light emitting device (Fig. 3) that contains a filler (26a), which contains a transparent and electrically conductive material (SiO_2). The filler is a transparent and electrically conductive material to produce a highly reflective mirror.

(Page 1, Paragraph 0006) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Lin by incorporating an electrically conductive material to produce a highly reflective mirror as taught by Coman.

Response to Arguments

Applicant's arguments filed 8/24/07 have been fully considered but they are not persuasive. Applicant's representative argues that the Sugiyama reference does not disclose the pattern contact layer to have the desired thickness because it is not a contact layer. This is erroneous, as the contact layer (3b) is form of a metal and would have electrical properties therefore the quantum dots (patterned contact layer 3b) of Sugiyama does disclose the claimed thickness. In regards to the argument that the Marshall reference does not disclose a cylinder shape contact layer, the Marshall reference was used to show that the contact layer could be formed of a cylinder shape. The amount of contact layers used in the Lin reference compared to the Marshall reference are irrelevant because it was only used to show that besides the contact layers being formed as other shapes it can also be formed of a cylinder shape. In regards to the argument of claim 27 referring to the filler being used to partially

Art Unit: 2822

planarize the contact layer. As seen in the Coman reference, the filler material (26a) is planarized in regards to the whole layer. Therefore the rejection stands.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 571-272-1844. The examiner can normally be reached on T-F 8:30-6:00 off Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KLR


Kiesha L. Rose
Primary Examiner
Nov. 5, 2007